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Publication date:
2014

Document Version
Publisher's PDF, also known as Version of record

DTU Food
National Food Institute

Trends in pedometer-measured steps per day in Danish adults: 2007 to 2012

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Introduction Objective measurements of physical activity have been lacking in Denmark. Therefore, little is known about the time trends in the population.

Purpose To examine temporal trends from 2007-2008 to 2011-2012 in pedometer-measured physical activity (steps/day) in a nationally representative sample of Danish adults.

Methods

- The study population comprised a random sample of Danish citizens aged 18-75 years who participated in the Danish National Survey of Diet and Physical Activity (DANSDA) in 2007-2008 (n=224) and 2011-2012 (n=1515).
- Sealed pedometer data (Yamax SW-200) were obtained for seven consecutive days.
- A total of 1624 participants (48.2% men) met the inclusion criteria, i.e. at least four valid days of data (≥ 10 h/d).
- Regression models adjusted for sex, age, education and season were used to analyse data.

Table 1. Steps/day and percentages of active and sedentary adults (mean (95% CI)), DANSDA 2007-2008 (n=202) and 2011-2012 (n=1408)

	All		Men		Women	
	2007-2008	2011-2012	2007-2008	2011-2012	2007-2008	2011-2012
Steps/day	8788 (8321; 9254)	8341 (8160; 8523)	8648 (8015; 9280)	8521 (8262; 8780)	8968 (8291; 9645)	8164* (7920; 8408)
≥ 10,000 steps/day (%)	34.8 (28.3; 41.3)	29.3 (26.9; 31.7)	27.0 (23.8; 30.2)	31.7 (28.1; 35.2)	39.8 (30.2; 49.5)	30.5** (22.0; 39.1)
< 5,000 steps/day (%)	14.2 (9.2;19.1)	16.4 (14.4; 18.4)	17.6 (14.8; 20.3)	15.3 (12.5; 18.0)	13.1 (6.1; 20.1)	14.9 (8.2; 21.7)
Steps/day incl. cycling[a]	9892 (9307; 10478)	9583 (9355; 9810)	9327 (8533; 10121)	9705 (9381; 10030)	10546 (9697; 11395)	9468* (9162; 9774)

*P<0.05, **P<0.01: Differences between survey periods using regression models
[a]160 step equivalents were added for each minute of cycling[1]

Results

- In 2011-2012, Danish adults took on average 8341 (95% CI 8160; 8523) steps/day.
- A significant difference was observed between men and women in 2011-2012 (p=0.046). However, when cycling was taken into account no difference between sexes was found (p=0.288).
- Mean steps/day decreased by 446 from 2007-2008 to 2011-2012 (Table 1).
- The proportion taking ≥10,000 steps/day decreased and proportion taking <5,000 steps steps/day increased (Figure 1). These changes was primarily due to a reduced level of activity among women as men maintained their activity level (Table 1).

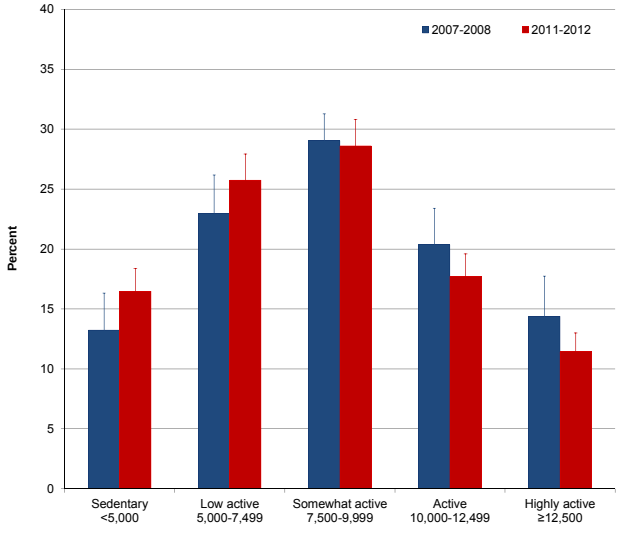

Figure 1. Danish adults categorized according to step-defined activity levels[2] in 2007-2008 and 2011-2012

Conclusion This nationally representative survey showed a tendency to a decline in daily steps due to a lower level of activity among women. The increased proportion with a sedentary and low active lifestyle is worrying from a public health perspective. Targeted actions should encourage these individuals, especially women, to increase their level of physical activity.

[1] Miller R, Brown WJ, Tudor-Locke C: **But what about swimming and cycling? How to count non-ambulatory activity when using pedometers to assess physical activity.** *J Phys Act Health* 2006, **3**:257-266.

[2] Tudor-Locke C, Bassett Jr, DR: **How many steps/day are enough? Preliminary pedometer indices for public health.** *Sports Med* 2004, **34**:1-8.